UNITED STATES PATENT AND TRADEMARK OFFICE

UNITED STATES DEPARTMENT OF COMMERCE
United States Patent and Trademark Office
Address: COMMISSIONER FOR PATENTS
P.O. Box 1450
Alexandria, Virginia 22313-1450
www.uspto.gov

APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/550,094	02/14/2008	Roy Skovgaard Hansen	006559.00009	5916

72165 7590 12/22/2010

BANNER & WITCOFF, LTD
ATTORNEYS FOR CLIENT 004770
1100 13TH STREET
SUITE 1200
WASHINGTON, DC 20005-4051

EXAMINER	
HAIDER, SYED	

ART UNIT	PAPER NUMBER
2611	

MAIL DATE	DELIVERY MODE
12/22/2010	PAPER

Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Office Action Summary	Application No.	Applicant(s)	
	10/550,094	HANSEN ET AL.	
	Examiner	Art Unit	
	SYED HAIDER	2611	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE *3* MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *14 February 2008*.

2a)☐ This action is **FINAL**. 2b)☒ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *1-25* is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *1-3,7-9,13-15,19-21 and 25* is/are rejected.

7)☒ Claim(s) *4-6,10-12,16-18,22-24* is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☒ The specification is objected to by the Examiner.

10)☐ The drawing(s) filed on _____ is/are: a)☐ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☐ All b)☐ Some * c)☐ None of:

1.☐ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☒ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☒ Information Disclosure Statement(s) (PTO/SB/08) Paper No(s)/Mail Date _____.
4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date _____.
5) ☐ Notice of Informal Patent Application
6) ☐ Other: _____.

DETAILED ACTION

Specification

The following title is suggested: List Output Viterbi Decoder with Blockwise ACS and Traceback.

Claim Objections

1. Applicant is advised that should claims [7-12] be found allowable, claims [19-24] will be objected to under 37 CFR 1.75 as being a substantial duplicate thereof. When two claims in an application are duplicates or else are so close in content that they both cover the same thing, despite a slight difference in wording, it is proper after allowing one claim to object to the other as being a substantial duplicate of the allowed claim. See MPEP § 706.03(k).

Claim Rejections - 35 USC § 112

1. The following is a quotation of the second paragraph of 35 U.S.C. 112:

> The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

2. Claims 1-25, are rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.

3. Claims 1,7,13 and 19 recites the limitation "the product" in lines 6, 5, 9 and 6 respectively. There is insufficient antecedent basis for this limitation in the claim.

Claim Rejections - 35 USC § 103

4. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

5. Claims 1-25, are rejected under 35 U.S.C. 103(a) as being unpatentable over Koizumi (US Patent 5,995,562) and further in view of Robertson (Variable Data Viterbi Decoder with Modified Lova Algorithm).

6. As per claims 1, 7 and 9, Koizumi discloses a Viterbi decoder for decoding convolution-coded data blocks, the decoder comprising a memory (Koizumi, Fig. 6:201) for storing a decision matrix and path metric processing means (Koizumi, Fig. 6:102:103:201) for populating the decision matrix in the memory with decision values on the basis of soft decision bits representing an input convolution-coded data block (Koizumi, Fig. 9, steps s21-s30, and Fig. 10),

Koizumi does not specifically disclose characterised in that the number of elements of said memory, used for storing the decision matrix, is less than the product of the number of valid states for the input convolution-encoded data block and the number of symbols in the input convolution-encoded data block.

Robertson discloses characterised in that the number of elements of memory, used for storing the decision matrix, is less than the product of the number of valid states for the input convolution-encoded data block and the number of symbols in the input

convolution-encoded data block (Robertson, Fig. 2, and Page 473 left hand column last paragraph and further please see page 474 last paragraph).

At the time of the invention it would have been obvious to one of ordinary skill in the art to modify Koizumi teachings by implementing the memory in which number of elements of memory, used for storing the decision matrix, is less than the product of the number of valid states for the input convolution-encoded data block and the number of symbols in the input convolution-encoded data block, as taught by Robertson.

The motivation would be to provide an improved viterbi decoder, as taught by Robertson.

7. As per claims 2, 8 and 20, Koizumi in view of Robertson further discloses a Viterbi decoder according to claim 1, wherein said number of elements is an integer sub-multiple of said product (Robertson, Page 473, Left hand column Last paragraph).

8. As per claim 3, 9 and 21, Koizumi in view of Robertson further discloses a Viterbi decoder according to claim 1, wherein the path metric processing means is configured for storing path metric sets (Koizumi, Fig. 6:201) associated respectively with a plurality of spaced symbols in the input convolution-coded data block (Koizumi, Fig. 6:201, and Fig. 7) and performing path metric processing for distinct sections of an input convolution-encoded data block using respective ones of said stored path metric sets as a starting state (Koizumi, Fig. 7, and Fig. 9).

9. As per claim 13, Koizumi further discloses a Viterbi decoder for decoding convolution-coded data blocks, the decoder comprising:

a decision matrix memory for storing a decision matrix (Koizumi, Fig. 6:201);

a path metric processing unit (Koizumi, Fig. 6:102) for populating the decision matrix in the memory with decision values on the basis of soft decision bits representing an input convolution-coded data block (Koizumi, Fig. 9, steps s21-s30, and Fig. 10);

Koizumi does not specifically disclose a traceback unit;

wherein the number of elements of said memory, used for storing the decision matrix, is less than the product of the number of valid states for the input convolution-encoded data block and the number of symbols in the input convolution-encoded data block.

Robertson discloses a traceback unit (Robertson, Fig. 2);

characterised in that the number of elements of memory, used for storing the decision matrix, is less than the product of the number of valid states for the input convolution-encoded data block and the number of symbols in the input convolution-encoded data block (Robertson, Fig. 2, and Page 473 left hand column last paragraph and further please see page 474 last paragraph).

At the time of the invention it would have been obvious to one of ordinary skill in the art to modify Koizumi teachings by implementing the memory in which number of elements of memory, used for storing the decision matrix, is less than the product of the number of valid states for the input convolution-encoded data block and the number of symbols in the input convolution-encoded data block, as taught by Robertson.

The motivation would be to provide an improved viterbi decoder, as taught by Robertson.

10. As per claim 14, Koizumi in view of Robertson further discloses a Viterbi decoder according to claim 13, wherein said number of elements is an integer sub-multiple of said product (Robertson, Page 473, Left hand column Last paragraph).

11. As per claim 15, Koizumi in view of Robertson further discloses a Viterbi decoder according to claim 13, including:
a path metric memory (Koizumi, Fig. 6:201) for storing path metric sets associated respectively with a plurality of spaced symbols in the input convolution-coded data block (Koizumi, Fig. 6:201);
wherein the path metric processing unit is configured for storing path metric sets (Koizumi, Fig. 201:103), associated respectively with a plurality of spaced symbols in the input convolution-coded data block, in said path metric memory (Koizumi, Fig. 201:103) and perform path metric processing for distinct sections of an input convolution-encoded data block using respective path metric sets, read from said path metric memory, as the starting states (Koizumi, Fig. 201:103, and Fig. 9).

12. As per claim 25, Koizumi in view of Robertson further discloses a communication device including a Viterbi decoder according to claim 1 (Koizumi, Fig. 11).

Allowable Subject Matter

13. Claims 4-6, 10-12,16-18, and 22-24 are objected to as being dependent upon a rejected base claim, but would be allowable if rewritten in independent form including all of the limitations of the base claim and any intervening claims.

14. **Examiner's note**: Examiner has cited particular paragraphs in the references as applied to the claims above for the convenience of the applicant. Although the specified citations are representative of the teachings of the art and are applied to the specific limitations within the individual claim, other passages and figures may apply as well. It is respectfully requested to the applicant in preparing responses, to fully consider the references in entirety as potentially teaching all or part of the claimed invention, as well as the context of the passage as taught by the prior art as disclosed by the Examiner.

Conclusion

Any inquiry concerning this communication or earlier communications from the examiner should be directed to SYED HAIDER whose telephone number is (571)270-5169. The examiner can normally be reached on Monday thru Friday 8:00 AM to 5:00 PM EST.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, David Payne can be reached on 571-272-3024. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

/S. H./
Examiner, Art Unit 2611

/David C. Payne/
Supervisory Patent Examiner, Art Unit 2611